



**NRDC Comments on ENERGY STAR Version 4.1,**

**Draft 2 Specification for Set Top Boxes**

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On behalf of the Natural Resource Defense Council (NRDC) and its 1.3 million members and electronic activists we respectfully submit these comments on EPA's Version 4.1, Draft 2 specification for Set-top Boxes (STBs). Our comments supplement those we submitted on April 13<sup>th</sup> on Draft 1 and others we submitted throughout this specification setting process. As stated previously, NRDC has a long standing interest in reducing the energy consumed by STBs and has published in-depth [reports](#) on national energy use of STBs which showed that in 2010 STBs consumed \$3 billion and nine 500 MW power plants worth of electricity annually, with much of that occurring when the user is neither watching nor recording a show. NRDC believes that ENERGY STAR's draft 2 specification includes many improvements from draft 1 and that with a few minor modifications EPA can finalize its Version 4.1 specification by its proposed August deadline.

Our comments focus on the following topics.

- Scope and treatment of gateway STBs
- Stringency of energy levels for thin clients
- Deep Sleep incentive in Version 4.1 and Version 5
- Inclusion of DTAs
- Whole home DVRs
- Cloud based DVRs
- Removal of HD and Advanced Video Processing Allowances

***Scope - NRDC supports EPA's decision to include displayless video gateways in the ESTAR specification and to provide allowances for networking functions such as routers, access points and telephony that may be incorporated into future STBs .***

In our prior comments, NRDC advocated for including in the ENERGY STAR scope both STBs that connect directly to a TV via a video output and those that provide access to the content through an alternate means such as an Ethernet cable or wireless network. In addition, we previously noted the industry trend towards convergence whereby networking functions may be incorporated into the STB and recommended expanding the specification scope and developing additional energy allowances to account for these new functions.

EPA incorporated these suggestions into Draft 2 and we fully support their decision to do so and agree with the proposed annual energy allowances and method for testing these devices.

One area where a new allowance might be warranted is for STBs that have DOCSIS 3 modems that operate in 8x4 mode. This higher number of up and down stream bonded channels will warrant higher on mode power when in use.

***Thin Clients - NRDC supports EPA's establishment of thin client annual energy levels that reward effective power management***

As many stakeholders have commented throughout this proceeding, thin clients represent an opportunity to dramatically reduce the annual energy use of STBs deployed on secondary TVs (e.g., the second, third and fourth TV in the home) and to reduce overall household energy use as well by coupling efficient thin clients with an efficient multi-room DVR that supplies the content to all the TVs in the home.

Per a presentation made at the 5/7/2013 CalPlug meeting by Echostar's Gary Langille, new thin clients by Direct TV use 40-44 kWh/year for clients with HNI, and 59 kWh/year for thin clients with HNI, Wi-Fi and Mimo. These levels are full device level values and reflect any power conversion losses in the power supply and the device. We encourage EPA to carefully look at the Direct TV C41 family of thin clients referred to above and to establish thin client base levels and adders that in total represent annual energy levels similar to these devices.

While cable does not appear to have thin clients today that can meet these levels, we believe the Direct TV models show what is already possible. Some of the cable thin clients that are based on Moca 2 do not currently have the necessary middleware to take advantage of the power management capabilities included in Moca 2 hardware. A strong spec for thin clients will help accelerate development of this middleware and the adoption of ENERGY STAR Version 4.1 qualified thin clients.

***Deep Sleep Incentive and Scheduler – Require STBs to also have a deep sleep scheduler deployed for a minimum of 4 hours deep sleep in order to qualify for the deep sleep incentive. In addition, EPA should remove the 30 second recovery time from its definition of deep sleep.***

ENERGY has proposed a deep sleep incentive for eligible boxes that translates into a 20% adder<sup>1</sup> to the allowable annual energy levels provided in the specification. In draft 2, the manufacturer can receive this incentive if the remote control has a deep sleep button **or** if the STB has a user scheduled function to automatically put the STB into deep sleep during specified hours of the day. In addition, during the June 17 webinar EPA added the requirement that recovery time from deep to sleep must be within 30 seconds. Below we provide recommendations on how to modify EPA's deep sleep incentive to increase the probability that these savings are realized in the field and not just on paper.

As we expressed previously the existence of a deep sleep button on the remote does not ensure that the user will take advantage of this feature and achieve incremental energy savings. With today's technology, there is a significant resume time (minutes not seconds) for STBs to wake from deep sleep to full functionality – i.e., ability to view updated program guide, change channels, schedule new recordings or access previously recorded content. Due to the unacceptably long recovery time from deep sleep, most users will not pick this feature and little to none of the anticipated savings will be achieved. In this case, the deep sleep incentive would result in a loss of much of the potential incremental savings between ENERGY STAR Versions 3.0 and 4.1

With a well-designed user scheduled deep sleep function, the STB would go into deep sleep during known periods of user inactivity, say 1 to 5 am. Consumers are more likely to take advantage of deep sleep via a scheduler provided:

- The STB is able to resume in <30 seconds when the user returns at some point outside of the scheduled deep sleep period, in this example after 5 am.
- The STB is capable of waking during the scheduled deep sleep period to record a previously scheduled show (just like the old ENERGY STAR VCRs did) or for a service provider update, and then go back to deep sleep.

To encourage adoption of deep sleep that results in real energy savings, we recommend the following modifications:

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<sup>1</sup> The credit of 17% translates to 1- .17 or .83.; when you multiple by the reciprocal of 0.83 in equation 1, this translates to a 20% additional annual energy allowance.

- 1. EPA require both the deep sleep button on the remote as currently defined, AND inclusion of the deep sleep scheduler in order to be eligible for the deep sleep incentive.*
- 2. The deep sleep scheduler should be set and deployed with a default deep sleep setting of 4 hours, from 1 to 5 am, or longer if the service provider so chooses.*
- 3. Do not require deep sleep to have a recovery time of 30 seconds during the deep sleep scheduled period. The 30 second recovery time would only apply to times outside of the prescheduled deep sleep period. ( EPA should maintain its current requirement that STBs in deep sleep should be able to wake to record a prescheduled show or receive an update, and then go back to deep sleep.)*
- 4. EPA should revisit the savings that would be provided from a 4 hour deep sleep implementation according to its specification and then adjust its incentive level from .17 accordingly.*
- 5. The user may modify the deep sleep settings at a later time. The manufacturer may not however disable this feature after deployment or prompt the user to do so at some time in the future.*

***Whole Home DVRs*** – NRDC supports ENERGY STAR’s philosophy of encouraging industry to shift to DVRs that are capable of supplying both recorded and live TV throughout the home as a means to lower total household energy use.

There are two types of DVRs that provide content to other TVs in the home. The first are called multi-room DVRs and they supply both recorded and live content to the secondary TVs. The secondary TVs in this case would be able to use low energy consuming thin clients. The other implementation uses “whole home” DVRs which stream recorded content to the secondary TVs but require use of a hybrid set top box to receive live content on the secondary TVs. Currently designed hybrid boxes use considerably more energy than thin clients, sometimes twice as much.

In its latest draft, EPA has included an adder of 56 kWh/yr for multi-room DVRs to account for the incremental energy that might be needed for multi-room DVRs to support the thin clients in the home. EPA also removed the adder for whole home DVRs. This has the consequence of making it very difficult for whole home DVRs to qualify and should accelerate the shift to the most energy efficient new customer deployments --multi room DVRs coupled with thin clients

***DTAs Within ENERGY STAR*** – NRDC supports EPA’s proposal to reinsert digital transport adapters (DTAs) into its final specification and we agree with the levels proposed.

During the 3/29/13 ENERGY STAR stakeholder meeting, representatives from the cable industry stated that DTAs are still commonly used and deployed within their system, in particular on the second and third TVs in the home. These devices are essentially a basic one-way cable box without the cable card slot. They are “one way” devices meaning they receive signal directly from the service provider (unlike a thin client which receives its content from a whole home STB but do not allow for two way communication such as the ability to order on demand movies).

EPA has reinstated DTA’s back into its proposal and provided a base allowance of 35 kWh/yr in Draft 2. There are currently two DTAs on Energy Star’s Qualified Products List (QPL) and they use 3 to 4 Watts of power or a reported annual energy consumption of 29 to 35 kWh/hr. Both of these models would qualify for EPA’s proposed level.

Keeping DTAs in the program maintains an incentive for manufacturers to deploy DTAs instead of basic STBs that consume significantly more annual energy. The low cost, lower energy DTAs provide service providers with an easy way to help meet the procurement targets required to maintain eligibility as an ENERGY STAR partner.

***Cloud Based DVRs – NRDC encourages EPA to add additional language to its specification around the topic of cloud based DVRs.***

We support EPA’s interpretation that cloud based DVRs are not eligible for the DVR energy allowance because they do not contain a hard disk drive or other non-volatile storage capabilities within the DVR.

During this month’s cable industry trade show, the trade press discussed the introduction of new “cloud based” DVRs that result in consumers storing and accessing their recorded shows from the service providers cloud (see <http://www.theverge.com/2013/6/11/4418868/comcast-xi3-dvr-ditches-hard-drive-puts-your-recordings-in-cloud>). This results in the removal of a hard drive inside the DVR resulting in lower STB product cost and significant on-site energy savings for the consumer. The current definition of DVR states that these types of DVRs are not considered DVR STBs for the purpose of the specification.

We agree with EPA’s determination in section 1D lines 47-52 that these types of DVRs do not warrant the current energy allowance provided for DVRs as they do not have a hard drive and do not incur the energy used to support them. We encourage EPA to add a new definition of “cloud DVRs” to the specification to make it more clear what these devices are, how they are treated in the specification, and that qualified models are eligible to earn the ESTAR label.

***High Definition and Advanced Video Processing Adders – NRDC supports EPA’s decision to remove the HD and AVP allowances as these features are now included in almost all boxes and have become a standard feature.***

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When Version 3 was being established HD and AVP were new features that were just being introduced and often resulted in sub optimal energy use as these features were not yet integrated into the system on chip (SOC) hardware solutions that offer better power management. Today's STBs all include these features and the total per box energy allowances proposed by ESTAR in Version 4.1 Draft 2 are being achieved without the need for the HD and AVP adders.